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The Present State of the Mining Industries of the United Kingdom. *By* ROBERT HUNT, ESQ., F.R.S., *Keeper of Mining Records, Museum of Practical Geology.*

[Read before the Statistical Society, 18th February, 1856.]

IN the Journals of the Statistical Society are to be found several valuable communications, on the mineral produce of some of the great mining districts of the United Kingdom. As, however, there does not appear to have been communicated to the Society any general statement of the entire mineral wealth of these Islands, I am induced to endeavour to supply this want. In my official capacity I have been for some years engaged in collecting all available information on subjects connected with British Mining,—metalliferous, and mineral products generally,—and our metallurgical processes. During the last two years especially, I have been engaged in obtaining statistical information connected with these industries; and the success, which has attended my efforts, must be judged of by the publications on "Mineral Statistics" which have issued from the MINING RECORD OFFICE in connection with the MUSEUM OF PRACTICAL GEOLOGY.

Since the publications referred to contain merely the bald details of the mineral productions of the different districts of the kingdom for each year, I have thought it would prove interesting—and, I trust, not be without value—to examine, by the aid of the data thus afforded, and such as are obtainable from other sources, the present state of our mining industries, and to advance to the consideration of the future prospects of the nation, in regard to this important source of our national wealth.

The laws regulating the distribution of the metalliferous ores are, notwithstanding the extent to which our exploration of mineral lodes has been carried, and the observations which have necessarily been made upon them, scarcely at all understood. Various theories have been from time to time propounded, some philosophers referring our mineral formations to the influences of subterranean heat, while others have thought they could detect evidences of an electro-

chemical process. The philosopher has, however, usually stood upon the surface of the earth, and in his speculations he has generally been guided by the imperfect observations of men who have never been instructed in any method of observation. Hence he has rarely been in a position which justified his forming any opinion as to the operations which nature had hidden in rocks, to the depth of which he himself had not penetrated.

The hypotheses connected with mineral formations may not appear subjects for the consideration of this society; but I think a few tabulated facts may serve to indicate some *constants* of much value to those who may be induced to launch upon—what has ever been, for want of sufficient data,—the uncertain sea of mining speculation. It is not supposed that the few general facts to which attention is now directed, are to be received as confirmatory of any especial view, they are simply given as *facts*, and it is only by collecting and tabulating such, that we can ever hope to relieve the search for the metalliferous ores from the uncertainty by which it is surrounded, and to escape from those sad examples of misrepresentation, some of which are to be referred to ignorance, but many unhappily to fraud.

In Cornwall and Devonshire, during the year 1854, 111 mines sold copper ores in quantities above 50 tons each. 3,225 tons were sold by smaller mines in quantities varying from 10 to 30 tons. I will select a few of the more productive of those mines, and give, upon the best obtainable information, the *direction* of the lodes producing the metalliferous ores in relation to the *true* North, the kind of rock in which the ore is found, and the distance (*approximate*) of the lode from the junction of the clay, slate, and granite.

Name of Mine.	Produce of Ore in Tons in 1854.	Average Mean Direction of Lodes.	Rock in which worked.	Distance from Junction in Chains.
Devon Great Consols ...	23,174	E. and W.	Clay-slate	40
Huel Buller	12,208	25° S. of W.	Granite and Slate	J.*
Huel Basset	8,378	24° S. of W.	Do.	J.
United Mines	11,827	27° S. of W.	Slate and Granite	25
Tresavean	3,990	30° S. of W.	Do.	J.
Carn Brea	6,231	30° S. of W.	Granite	J.
Fowey Consols	4,440	E. and W.	Slate	30
Alfred Consols	3,712	15° S. of W.	Slate and Greenstone	J.
South Huel Frances	2,783	20° S. of W.	Granite	20
West Caradon	4,018	E. and W.	Do.	25
West Basset	5,231	18° S. of W.	Slate	J.
Tincroft	3,791	20° S. of W.	Slate and Granite	J.
North Roskear	2,216	32° S. of W.	Slate and Greenstone	30
Halamanning	2,508	20° S. of W.	Slate	20
Huel Seton	4,945	15° S. of W.	Do.	70
Botallack	1,453	20° W. of N.	Slate and Greenstone	20
Levant	1,589	18° W. of N.	Do.	20

These are selected as a few striking examples of the fact, that nearly all our lasting and profitable copper mines have been in close proximity to the junction of two dissimilar rocks, and that the lodes

* J signifies that the *lode* is chiefly productive along the line of junction.

have a main line of general direction. Immediately around the granite formations of the Constantine mass, and the granite hills of Carn Marth and Carn Brea, are grouped about 100 tin and copper mines, the greater number of which have been especially productive, and all these have a general direction of about 20° S. of W.

Amongst this group may be enumerated the following—and the quantity of ore sold within the periods named is given.

	Ore.	Value.		
	Tons.	£	s.	d.
Tresavean, 1815 to 1854	234,402	1,383,268	11	6
United Mines, Do.	282,848	1,654,334	4	6
Dolcoath, Do.	240,214	1,347,367	9	0
North Roskear, Do.	145,624	853,102	16	0
South Do. 1821 to 1850	38,904	210,332	8	6
Huel Buller and Beauchamp, 1822 to 1846	65,804	333,871	10	0
Huel Unity, 1815 to 1852	112,410	714,080	13	6
Huel Damsel, 1815 to 1842	34,618	258,497	16	6
Huel Bassett, 1815 to 1854	88,174	607,365	10	6
Huel Gorland, 1815 to 1848, and 1851	41,499	254,808	14	6
Tin Croft, 1815 to 1827, and 1834 to 1854	86,398	363,076	1	6
Cook's Kitchen, 1815 to 1846	45,583	179,627	14	6
Camborne Vean, 1815 to 1826, and Stray Park, 1826 to 1854	60,797	335,729	12	0
Consolidated Mines, 1815 to 1854	435,408	2,845,482	13	0
Huel Jewell, 1815 to 1824, and 1829 to 1853	58,160	400,190	13	6
Huel Maid and Carharrach, 1820 to 1852	33,571	191,460	12	0
Carn Brea Mines, 1833 to 1854	148,983	852,385	3	0
East Huel Crofty, 1832 to 1854	101,952	534,816	12	0

Those mines only have been selected of which a correct return for several years could be obtained. An examination of the district around St. Austle will show that the same conditions prevail. The Liskeard and Callington mines observe similar orders of proximity, and around the edge of the great granite formations of Dartmoor, where the geological conditions are similar to those of Cornwall, productive mines are now developing themselves.

The lead-lodes of Western England are *generally* found at nearly right-angles to the lines of the copper lodes, their run being about N. and S. The lead-lodes of Flintshire have a main run from E. to W., some few of them, however, running from the S. of E. to the N. of W. The lodes of Alston-moor have also an easterly and westerly direction. Of the Cardiganshire mines, which have been worked since the times of the Romans, Mr. Warington Smyth, who has very carefully examined the district, says:—* "The most general strike of the lodes is E.N.E. and W.S.W., a direction so subject to frequent variations for small distances, that some of the minor veins, if drawn in plan on a large scale, would appear to describe a zig-zag line; such being particularly the case when the beds of rock frequently vary in their nature. Nearly all of the most productive deposits agree

* On the Mining District of Cardiganshire and Montgomeryshire. By Warington W. Smyth, M.A., F.G.S. Memoirs of the Geological Survey of Great Britain, and of the Museum of Practical Geology, vol. ii., Part 2.

within a few degrees with this course, as Goginan, Daren, Cwm Symlog, Logaulas, &c.; whilst, among the exceptions, Tre Taliessin, which runs N.W. and S.E., is said to have returned considerable quantities of lead ore, and the 'Comet' lode at Cwm Ystwyth, coursing W.N.W., has within the last few years yielded several thousand tons:—although *only* near its junction with the '*main*' lode, which points E.N.E."

It is true that, in the lead-lodes, the same relation to the lines of junction between dissimilar rocks is not to be detected; but we are not entirely without evidence, which appears to show that some analogous law is equally in operation in those mineral lodes occurring in the stratified districts, as that which so distinguishingly marks the mineral districts of western England.

Mining operations are carried on to a greater or less extent in 21 English counties and the Isle of Man; in 12 Welsh counties, and in 17 counties in Scotland. The following Table, in which the letters indicate the metals found,—C, signifying coal, and Co, copper,—will at one view exhibit the distribution of our mineral wealth.

	Coal.	Iron.	Copper.	Tin.	Lead.	Silver.	Manganese.	Zinc.	Gold.	Antimony.	Nickel and Cobalt.
Cornwall	....	I.	Co.	T.	L.	S.	....	Z.	G.	A.	N.&C.
Devonshire	C.	I.	Co.	T.	L.	S.	M.	Z.	G.	A.	....
Somersetshire	C.	I.	Co.	....	L.	....	M.	Z.	....	....	....
Gloucestershire	C.	I.	....	....	....	..	....	....	....	....	....
Herefordshire	C.	....	....	....	....	....	....	....	....	....	....
Shropshire	C.	I.	....	....	L.	....	....	....	....	....	....
Staffordshire	C.	I.	....	....	....	....	....	....	....	....	....
Worcestershire	C.	I.	....	....	....	....	....	....	....	....	....
Warwickshire	C.	I.	....	....	....	....	M.	....	....	....	....
Northamptonshire	....	I.	....	....	....	....	....	....	....	....	....
Leicestershire	C.	...	Co.	....	L.	....	....	....	....	....	....
Lincolnshire	....	I.	....	....	....	....	....	....	....	....	....
Nottinghamshire	C.	....	....	....	....	....	....	....	....	....	....
Derbyshire	C.	I.	Co.	....	L.	....	....	....	G.	....	....
Cheshire	C.	....	....	....	....	....	....	....	....	....	....
Lancashire	C.	I.	Co.	....	L.	....	....	....	....	....	....
Yorkshire	C.	I.	....	....	L.	S.	....	....	....	....	....
Durham	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Northumberland	C.	I.	....	....	L.	S.	....	....	....	....	....
Cumberland	C.	I.	Co.	....	L.	S.	....	Z.	....	....	N.&C.
Westmoreland	C.	I.	Co.	....	L.	S.	....	....	....	....	....
Isle of Man	....	I.	Co.	....	L.	....	M.	Z.	....	....	....

In this, and the following table, only the localities in which the minerals have been effectively worked are given. IRON, for example, exists in large quantities, in the eastern and south-eastern counties, in the green-sand formations. British iron was at one time made entirely from the green-sand iron stones, but at present none of this ore is employed in our iron manufactures, if we except a small quantity raised in Dorsetshire. Many of the metals named are known to exist in small quantities in counties in which I have not marked their occurrence.

WALES.

	Coal.	Iron.	Copper.	Tin.	Lead.	Silver.	Manganese.	Zinc.	Gold.	Antimony.	Nickel and Cobalt.
Monmouthshire	C.	I.	....	....	....	....	....	....	....	....	....
Glamorganshire	C.	I.	....	....	L.	S.	....	....	....	....	....
Caermarthenshire	C.	I.	....	....	L.	S.	....	....	G.	....	....
Pembrokeshire	C.	....	....	....	....	....	....	....	....	....	....
Cardiganshire	....	....	Co.	....	L.	S.	....	Z.	....	....	....
Brecknockshire	C.	I.	....	....	....	....	....	....	....	....	....
Montgomeryshire	C.	....	....	....	L.	S.	....	....	....	....	....
Flintshire	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Denbighshire	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Merionethshire	C.	....	Co.	....	L.	S.	....	....	G.	....	....
Caernarvonshire	C.	I.	Co.	....	L.	S.	....	....	....	....	....
Anglesea	C.	I.	Co.	....	....	....	....	....	....	....	....

SCOTLAND.

Dumfriesshire	C.	....	....	....	L.	S.	....	....	....	....	....
Kirkcudbright	....	I.	Co.	....	L.	S.	....	....	....	....	....
Wigtonshire	....	....	....	....	L.	....	....	....	....	....	....
Ayrshire	C.	I.	....	....	....	....	....	....	....	....	....
Renfrewshire	C.	I.	....	....	....	....	....	....	....	....	....
Dumbartonshire	C.	....	....	....	....	....	....	....	....	....	....
Lanarkshire	C.	I.	....	....	L.	S.	....	G.	....	....	....
Stirlingshire	C.	....	....	....	....	....	....	....	....	....	....
Linlithgowshire	C.	I.	....	....	....	....	....	....	....	....	....
Edinburghshire	C.	I.	....	....	....	....	....	....	....	....	....
Peeblesshire	C.	....	....	....	....	....	....	....	....	....	....
Haddingtonshire	C.	....	....	....	....	....	....	....	....	....	....
Fifeshire	C.	I.	....	....	....	....	....	....	....	....	....
Clackmannanshire	C.	....	....	....	....	....	....	....	....	....	....
Perthshire	C.	....	....	....	L.	S.	....	....	....	....	....
Argyleshire	C.	....	....	....	L.	S.	....	....	....	....	N.

IRELAND.

Galway	....	....	....	....	L.	S.	....	....	....	....	....
Queen's County	C.	....	....	....	....	....	....	....	....	....	....
Carlow	C.	....	....	....	....	....	....	....	....	....	....
Kilkenny	C.	....	....	....	....	....	....	....	....	....	....
Wicklow	....	I.	Co.	....	L.	S.	....	....	G.	....	....
Tipperary	C.	....	Co.	....	L.	S.	....	....	....	....	....
Down	....	....	....	....	L.	S.	....	....	....	....	....
Kerry	C.	....	....	....	....	....	....	....	....	....	....
Tyrone	C.	....	....	....	....	....	....	....	....	....	....
Antrim	C.	....	....	....	....	....	....	....	....	....	....
Wexford	....	....	....	....	L.	S.	....	....	....	....	....
Limerick	C.	....	....	....	L.	S.	....	....	....	....	....
Cork	C.	....	Co.	....	L.	S.	....	....	....	....	....
Waterford	C.	I.	Co.	....	....	....	....	....	....	....	....
Clare	C.	....	....	....	L.	S.	....	....	....	....	....
Monaghan	....	....	....	....	L.	S.	....	....	....	....	....

The number of mines at work in the United Kingdom may be stated as follows:—

	England.	Wales.	Scotland.	Ireland.	Total.
Collieries	1,704	306	368	19	2,397
Copper mines	220	12	....	15	247*
Tin do.	130	....	....	....	130†
Lead do.	318	179	14	19	530‡

It has not been possible, from the peculiar condition of iron mining, to give with any exactness the number of mines producing iron in the United Kingdom. Zinc and the other metals, being commonly produced by the lead or copper mines, are omitted from the list, as are the few mines producing the rarer minerals. Having given a general statement of the extent of the mines of this country, it is now important that we should proceed to the examination of each mineral industry in detail.

TIN was probably obtained in this country at as early—if not an earlier—period than any other metal. A paper was communicated to the *Statistical Society*, in 1839, by Mr. Joseph Carne, of Penzance, on the "*Statistics of the Tin Mines of Cornwall, and of the Consumption of Tin in Great Britian.*" This paper enters so fully into the earlier history of the tin trade, that I am relieved from the necessity of enlarging upon it.

Mr. Carne has given a table of the production of tin in Cornwall from 1750 to 1837. In the following table, however, I repeat a portion of this, my object being to show the progress of tin mining during the present century:—

Produce of British Tin Mines since 1800.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1800....	2,522	1814....	2,611	1828....	4,931	1842....	....
1801....	2,365	1815....	2,941	1829...	4,434	1843....	....
1802 .	2,669	1816 ...	3,348	1830....	4,444	1844....	....
1803 ...	2,960	1817 ...	4,121	1831....	4,300	1845....	....
1804....	3,041	1818....	4,066	1832....	4,323	1846....	....
1805....	2,785	1819....	3,315	1833....	4,065	1847....	....
1806 ...	2,905	1820....	2,990	1834....	2,989	1848....	6,613
1807....	2,465	1821....	3,373	1835 ...	4,228	1849....	6,952
1808....	2,371	1822....	3,278	1836....	4,054	1850 ...	6,729
1809....	2,548	1823....	4,213	1837....	4,790	1851....	6,143
1810....	2,036	1824....	5,005	1838....	5,130§	1852 ...	6,287
1811....	2,385	1825....	4,358	1839....	....	1853....	5,763
1812 ...	2,373	1826....	4,603	1840....	....	1854....	5,947
1813....	2,324	1827 ...	5,565	1841....	....	1855....	6,000

* In this number there are included several mines producing but small quantities of copper ore, but those are excluded (perhaps about 50,) which are not producing ore, and which exhibit little prospect of doing so.

† Some of the mines included in this number are producing copper as well as tin. The stream works for tin are not included.

‡ In Derbyshire and in some other counties there are numerous workings producing a few cwt. per annum, in which two or three men only are employed; these are not included in this number.

§ After the Michaelmas quarter of 1838 the coinages ceased, and, consequently, accurate returns could not be obtained for some years; the later returns are obtained from the smelters and other sources, which may be relied on.

The following lists give not merely the produce of all the important tin mines in Cornwall producing tin ore in 1855, but the names of several others from which tin was raised but not sold. The mines are divided into districts for the purpose of indicating their situations.

Penzance District, including St. Just and St. Ives.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Providence Mines	270	11	3	0	17,895	0	0
2	Balleswidden	252	8	3	27	18,086	18	7
3	Levant	223	10	0	25	14,680	10	0
4	Huel Owles	217	2	0	7	15,744	19	6
5	St. Ives Consols	214	0	1	25	12,840	0	0
6	Boscean	209	10	3	10	14,311	5	9
7	Ding Dong	146	0	0	0	9,809	0	0
8	Botallack	139	15	3	1	9,352	7	10
9	Lewis Mines	104	0	0	0	6,670	0	0
10	East Huel Margaret	99	19	0	19	5,997	0	0
11	Huel Margaret	88	17	0	0	5,323	11	3
12	Spearne Moor	51	9	2	15	3,089	0	0
13	Huel Kitty	39	19	2	4	2,409	0	7
14	Carn Yorth	22	0	0	0	1,480	11	6
15	Lelant	20	0	0	0	1,154	11	1
16	Spearne Consols	7	0	0	0	425	4	0
17	Huel Margery	5	8	1	9	324	0	0
18	North Levant	2	0	0	0	89	7	0
19	Huel Bosorn	1	1	2	24	70	19	8
20	South Providence	4	6	0	13	240	0	0
21	Trelyon Consols	.....				.....		
22	Balleswidden United	.....				.....		
23	Huel Bal	.....				.....		
24	Huel Reeth	.....				.....		
25	Balnoon Consols	.....				.....		
26	East Balleswidden	.....				.....		
27	Mount Tiack	.....				.....		
28	North Ding Dong	.....				.....		
29	Huel Carne	.....				.....		
30	Huel Margery (St. Ives)	.....				.....		
31	Huel Powl	6	10	3	27	413	2	0

Helstone District, including St. Hilary, &c.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Great Huel Vor United	229	19	2	21	12,668	0	1
2	Porkellis United	167	8	3	18	9,951	0	9
3	Great Work	149	2	0	2	8,946	0	0
4	Huel Lovell	107	10	2	2	7,407	12	2
5	Wendron Consols	100	0	2	11	5,597	18	6
6	Huel Guskus	83	0	2	14	4,980	0	0
7	Huel Enys	77	8	2	3	4,384	16	4
8	Leeds and St. Aubyn	42	1	2	19	2,757	3	9
9	Trumpet Consols	40	0	0	0	2,977	2	8
10	East Huel Vor	32	19	2	1	1,814	2	0
11	Great Huel Fortune	30	0	0		1,489	14	5
12	Huel Trevelyan	25	9	2	13	1,565	3	1
13	Huel Widden	24	10	3	17	1,816	10	3
14	Trenear Sett (part of Wendron Consols)	17	17	3	14	1,032	3	3
15	Mill Pool	15	14	0	3	1,005	17	2
16	Sundry Stream Works in the Duchy of Cornwall lands, in the manor of Helstone, in Kerrier	6	5	2	2	427	1	8
17	St. Aubyn and Grylls	5	5	0	3	327	10	5
18	Christopher Consols	3	0	0	0	151	5	6
19	Wendron United	1	6	0	8	84	4	3
20	South Huel Charlotte	0	16	0	17	52	13	10
21	Wellington Mines		.....				.....	
22	East Rosewarne		.....				.....	
23	Polgear and Lancarrow		.....				.....	
24	Sithney Huel Buller		.....				.....	
25	Trevoole (Crowan)		.....				.....	
26	Huel Helen		.....				.....	
27	Huel Hender		.....				.....	
28	Huel Trevena		.....				.....	
29	Trevenan Mine		.....				.....	

Redruth, Camborne, and St. Agnes District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Dolcoath	389	9	0	16	23,367	0	0
2	Polberro	264	13	2	27	16,940	4	9
3	Lewis Mine	104	0	0	0	6,670	0	0
4	Huel Kitty	99	12	2	24	6,281	13	8
5	Condurrow	93	11	0	26	5,613	0	0
6	West Huel Towan	83	19	0	0	8,607	9	9
7	Tincroft	76	16	2	23	4,909	10	7
8	Huel Betsy	63	6	2	22	4,088	9	6
9	Pednandrea	55	3	2	1	3,695	12	7
10	Huel Unity Consols	31	9	3	0	959	0	0
11	Huel Tremayne	30	0	0	0	1,434	15	1
12	Huel Bassett	22	0	2	16	1,382	3	0
13	Huel Unity	21	0	0	0	1,186	14	0
14	St. Day United	20	0	0	0	1,597	16	6
15	South Huel Francis	19	19	2	20	1,271	11	6
16	Budnick Consols	18	5	1	10	1,192	19	1
17	Huel Friendly	16	7	2	14	835	10	10
18	Stray Park	16	0	0	0	987	17	1
19	Huel Jane (Kea)	15	0	0	0	925	17	2
20	Creegbraws	13	0	0	0	710	5	4
21	West Huel Jane	10	12	1	22	656	16	10
22	Trenow Consols	8	0	0	0	407	2	0
23	Leeds Town Consols	7	16	0	3	512	17	5
24	Huel Rock	6	4	1	2	349	5	10
25	Huel Seton	5	0	0	0	308	16	4
26	Turnavore	4	12	0	14	230	6	0
27	Huel Coates	4	6	1	2	240	16	2
28	Trevellas Park, or Beach Stream	4	2	0	26	242	12	2
29	Cligger, or Cleggo, Park Stream	3	9	3	0	220	7	10
30	Trevanance Stream	2	9	3	8	189	3	6
31	North Huel Crofty	2	0	0	0	81	3	6
32	North Bassett	2	0	0	0	108	8	11
33	Perran Park Stream	1	11	0	24	61	17	6
34	Huel Harriet	1	8	2	6	92	14	6
35	West Polberro	1	5	3	9	67	12	8
36	North Huel Unity	1	0	0	0	41	19	4
37	Great Huel Baddern (Kea)	1	0	0	0	46	14	3
38	South Crofty	1	0	0	0	47	4	11
39	West Bassett	0	10	0	0	31	0	0
40	Perran, or Bolenna	0	15	2	4	39	9	8
41	Huel Uny		.....			.....		
42	Cook's Kitchen		.....			.....		
43	East Pool		.....			.....		
44	Trelyon Consols		.....			.....		
45	West Huel Providence		.....			.....		
46	Huel Trefusis		.....			.....		
47	West Providence (St. Erth)		.....			.....		
48	Budnick Consols		.....			.....		
49	Clijah and Wentworth		.....			.....		
50	Gilmar (St. Erth)		.....			.....		
51	Great Huel Busy		.....			.....		
52	Kea Tremayne		.....			.....		
53	Perran St. George		.....			.....		
54	Prince Albert Company		.....			.....		
55	South Condurrow		.....			.....		
56	Huel Nelson		.....			.....		

St. Austle District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Great Polgooth	235	17	3	9	15,465	3	6
2	Boscundle	99	17	0	0	5,991	0	0
3	Great Beam	78	10	2	26	5,444	3	9
4	Rocks and Treverbyn	39	9	2	6	2,737	4	0
5	Great Hewas United	35	16	2	9	2,344	15	10
6	St. Austle Consols	30	0	0	0	1,800	0	0
7	St. Dennis Consols	22	4	2	23	1,334	0	0
8	Union (Roche)	16	0	0	0	1,189	13	3
9	Sundry stream works in the Manor of Treverbyn*	14	12	0	11	1,016	11	3
10	Great Dowgas	13	4	3	20	901	17	5
11	Great Moor Streams	7	13	3	24	581	17	8
12	Huel Virgin	7	5	2	21	548	11	7
13	Carclaze Sett*	7	3	1	22	530	1	0
14	Huel Anna	5	13	0	10	365	10	8
15	Carvath United*	2	0	0	0	135	3	6
16	Tretoil (Bodmin)	2	10	0	0	117	10	0
17	Trebell (Lanivet)	1	17	3	5	114	6	6
18	St. Austle Hill Consols	1	11	3	15	111	16	2
19	Huel Marshall	1	8	2	0	83	19	3
20	Carvath United		.....			.....		
21	Duke of Cornwall		.....			.....		
22	West Fowey Consols		.....			.....		
23	Huel Polmear		.....			.....		
24	Charlestown Mines		.....			.....		
25	Grey Mare		.....			.....		
26	Lower Nine Stones Cleave and Lantern*	0	3	2	7	10	13	3

* These represent the portions of tin ore only, upon which royalties were paid to the Duchy of Cornwall.

Liskeard and Callington District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Drake Walls	264	17	0	8	17,748	19	3
2	Phœnix (Linkinhorne)	11	15	0	5	662	19	1
3	St. Dennis Consols	7	0	3	32	464	9	10
4	West Phœnix	6	18	2	3	429	11	2
5	Huel Arthur	5	17	0	12	400	15	10
6	Alturnum Consols	3	14	2	24	205	15	5
7	Huel Mary Consols	1	0	0	0	35	18	0
8	Huel Robins		.....				.....	
9	Fox Tor (Alturnum)		.....				.....	
10	Hawkmoor (Calstock)		.....				.....	

Mr. Carne informs us that the prices paid to the tinner in Cornwall, between the years 1746 and 1788, varied from 60*s.* the cwt. to 72*s.* the cwt. In a Report of a Select Committee of the House of Lords on the state of the British Wool Trade, is a table compiled by Edward Charles Hohler, giving the average prices of several articles, amongst others of TIN, from 1783 to 1828 inclusive. From this table the following extract is made:—

	£	s.	d.			£	s.	d.	
1783	4	1	7	per cwt.	1810	7	9	8	per cwt.
1789	3	10	3	,,	1815	7	3	0	,,
1794	5	0	3	,,	1820	3	15	9	,,
1800	5	4	2	,,	1825	4	16	6	,,
1805	5	15	8	,,					

This does not differ materially from the prices given by Mr. Carne as the prices paid to the tinner in Cornwall; the apparent discrepancies arise from the fact, that the above table is the price of tin in the metal market, therefore we have to add, to the price for tin ore, the cost of bringing it into the metallic state.

The annual value of the tin ore raised in England within the last two or three years has been as follows:—

	Tin Ore Raised.			Average Value per Ton.	Total Value of Ore.
	Tons	cwt.	qrs.	£	£
1853	8,866	0	0	68	593,088
1854	8,747	0	0	64	559,808
1855	8,947	0	0	68	608,396

The value of the metallic tin produced in 1853, when the price varied from 112*l.* to 118*l.* per ton, may be estimated at 700,000*l.* In 1854, the range of prices, not very different from those of the previous year, gives a total value of 690,000*l.* The average prices of 1855 were—

	£	s.	d.
English blocks	125	0	0
,, bars	126	0	0
,, refined	129	0	0

Table of Tin Imported into, and of British and Foreign Tin Exported from the United Kingdom since 1833.

	Imported.			British Tin Exported.			Foreign Tin Exported.		
	Tons	cwt.	qrs.	Tons	cwt.	qrs.	Tons	cwt.	qrs.
1833	1,756	4	3	1,249	9	1	1,942	9	3
1834	2,338	9	3	467	11	2	2,334	4	3
1835	985	4	2	388	5	0	1,189	15	0
1836	1,161	15	2	558	0	0	861	0	0
1837	1,451	0	0	864	0	0	1,461	0	0
1838	1,536	3	0	1,254	0	0	1,451	0	0
1839	912	0	3	1,465	7	1	1,138	5	2
1840	469	19	3	1,844	4	3	329	13	2
1841	1,421	14	2	1,167	0	1	1,267	4	2
1842	555	11	2	3,088	3	3	620	12	0
1843	1,559	6	1	1,819	16	0	650	7	0
1844	604	5	0	1,110	16	1	957	13	2
1845	1,278	7	2	576	5	3	917	7	1
1846	1,015	5	2	1,195	3	0	1,051	18	2
1847	1,165	0	0	1,741	1	3	573	10	2
1848	299	3	1	1,771	5	3	417	0	2
1849	1,798	2	0	1,764	12	0	446	19	3
1850	1,685	11	0	1,588	1	2	189	15	4
1851	2,587	1	0	1,011	0	0	245	9	0
1852	2,372	2	3	941	12	0	433	3	0
1853	2,487	0	1	1,277	0	0	1,072	10	0
1854	2,251	1	0	1,405	14	0	668	16	0
1855	1,612	7	0	1,337	14	0	280	0	0

From this table will be apparent the quantity of foreign tin re-exported and that retained for home consumption. The principal importations of tin of late years have been from the following countries:—

	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	Total.
	Tons	Tons.	Tons	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Singapore	427	938	517	636	136	1,145	636	805	750	1,555	1,158	8,303
Java	128	102	48	36	....	....	....	....	....	....	1	315
Siam	40	10	....	....	....	....	....	....	....	....	....	50
East India Company's territories	3	97	198	125	7	294	347	459	225	548	438	2,738
Holland	4	43	158	15	73	104	433	952	1,307	587	391	4,567
Peru	....	11	....	4	18	17	20	70	12	73	23	248
China	....	....	87	344	14	195	15	2	15	98	228	998
Van Diemen's Land	....	....	....	1	....	....	....	....	....	....	....	1
Belgium	....	....	....	....	26	....	....	....	....	....	....	26
Spain	....	....	....	....	21	31	115	54	....	....	....	221
Port Phillip	....	....	....	....	....	....	9	....	....	....	8	17
United States	....	....	....	....	....	....	79	178	....	....	....	257

The existence of tin in Australia and Van Diemen's Land is a fact of considerable interest. The tin which has been forwarded to this country from Victoria, contains a considerable quantity of gold, which has induced those engaged in metallurgical operations to urge

upon the "diggers" who may not have been so successful as they desired in their search for gold, to look after the less valuable metal.

For a considerable period there has not been a discovery of any new locality in this country for tin. The Cornish stream works are not so productive as they were, and the mines producing tin are being worked at a constantly increasing cost. In the meantime the demand for tin in our white metal manufactures is rapidly increasing. We may, therefore, fairly expect that the stanniferous produce of our colonies is destined to meet the increasing demand for this rare and valuable metal.

The paper by Sir Charles Lemon on the "Statistics of the Copper Mines of Cornwall," published in the Journal of the Society in June, 1838, renders it unnecessary that I should trouble the Society with any of the matters connected with the early history of copper mining. These have been very fully treated of by one who is thoroughly familiar with all that concerns the county which he represents in Parliament. With the view, however, of showing the progress which has been made in copper mining, I have compiled the following brief table:—

The Produce of the Copper Mines of Cornwall from the Year 1725, *in Periods of Ten Years.*

	Tons of Ore.	Average Price per Ton.	Amount Realized.
		£ s. d.	£
From 1725 to 1735.....	64,800	7 15 10	473,500
,, 1735 to 1745.....	75,520	7 8 6	560,106
,, 1745 to 1755.....	98,790	7 8 0	731,457
,, 1755 to 1765.....	169,699	7 6 6	1,243,045
,, 1765 to 1775.....	264,273	6 14 6	1,778,337
,, 1775 to 1785.....	304,133	6 3 0	1,827,106
,, 1785 to 1795*	....	....	..
,, 1795 to 1800.....	249,834	8 9 6	2,177,724†

The produce of copper ore has been given by Sir Charles Lemon to the end of 1837. Commencing from that date, the following may be received as an exact statement of the progress of this especial mineral industry. The accounts are made up to the 30th of June in each year specified.

* The produce of the mines for the years 1789 to 1794 cannot be obtained, but the quantities of copper ore sold in the other years of the period were as follows:—

	Tons.	Amount.
		£
1786.....	39,895	237,237
1787.....	38,047	190,738
1788.....	31,541	150,303
1794.....	42,815	320,875
1795.....	43,589	326,189

† This includes the last five years of the last century only.

Date.	Number of Mines Selling Ore at Tickets.*	Total of Ore Sold.				Fine Copper in Ore.				Money Value.			Standard.		
		Tons, 21 cwt.	cwt.	qrs.	lbs.	Tons, 21 cwt.	cwt.	qrs.	lbs.	£	s.	d.	£	s.	d.
1838	76	145,688	20	0	0	11,527	4	1	17	857,779	11	0	109	3	0
1839	79	159,551	0	0	0	12,450	18	1	24	932,297	12	6	110	2	0
1840	79	147,266	0	0	0	11,037	16	3	1	792,758	3	6	108	10	0
1841	79	135,090	0	0	0	9,987	2	1	23	819,949	2	0	119	6	0
1842	70	135,581	0	0	0	9,896	3	0	15	822,870	12	0	120	16	0
1843	64	144,806	0	0	0	10,926	1	0	6	804,445	19	0	110	1	0
1844	68	152,667	0	0	0	11,246	14	1	20	815,246	9	6	109	17	0
1845	77	157,000	0	0	0	12,239	2	3	11	835,358	19	6	103	10	0
1846	88	158,913	0	0	0	12,447	16	1	16	886,785	1	6	106	8	0
1847	92	148,674	0	0	0	11,966	8	0	18	830,739	9	0	103	12	0
1848	90	155,616	0	0	0	12,869	19	1	16	825,080	2	6	97	7	0
1849	89	144,938	0	0	0	12,052	17	3	23	716,917	7	0	92	11	0
1850	72	150,890	0	0	0	11,824	0	1	21	814,037	3	0	103	19	0
1851	76	154,299	0	0	0	12,199	16	1	15	808,244	1	6	101	0	0
1852	82	152,802	0	0	0	11,706	16	3	20	828,057	19	6	106	12	0
1853	94	180,095	0	0	0	11,839	14	0	0	1,124,561	2	0	136	16	0
1854	96	180,687	0	0	0	11,779	14	0	0	1,153,756	3	6	140	2	0
1855	106	188,969	0	0	0	12,241	18	0	0	1,212,686	8	0	141	10	0

I have for some years obtained the annual produce of the copper mines for each particular year made up to the end of December. Without this statement it might appear that some discrepancy existed between the returns now given and those published in the "*Memoirs of the Geological Survey of Great Britain.*" There may be some advantage in giving the sales from our Cornish copper mines for each particular year; these may be regarded as close to the truth, the private contract sales having been unimportant.

	Ore.	Copper.				Value.		
	Tons.	Tons	cwt.	qrs.	lbs.	£	s.	d.
1848.....	147,701	12,241	19	2	5	720,090	17	0
1849.....	146,326	11,683	13	0	22	763,614	19	0
1850.....	155,025	12,253	10	2	21	840,410	16	0
1851.....	150,380	11,807	8	2	18	782,947	8	6
1852.....	165,593	11,776	17	2	24	975,975	14	0
1853.....	181,944	11,913	12	0	12	1,155,167	3	6
1854.....	184,858	11,979	4	2	21	1,192,696	12	6
1855.....	195,193	12,578	11	0	23	1,263,739	6	0

In neither of the tables given have the quantities of copper ore bought by private contract by the great copper smelting firms been included. As it is not always easy to obtain information in detail of these purchases, and consequently to separate British from Foreign ores, it is thought advisable to make a separate statement of the private contract purchases after the tables of English, Irish, and Foreign copper ores. The earliest accounts of the Swansea sales

* Sundry small mines selling under ten tons are not included in this number.

which I have been enabled to obtain are from 1804, when first the copper sales were published in the *Cambrian* newspaper. The publication of the printed ticketing papers commenced in 1839. As these returns show a very remarkable extension of the copper trade of Swansea, the amount sold for each year is given.

Copper Ores sold at Swansea from the Year 1804 *to* 1847.

Date.	English.	Welsh.	Irish.	Foreign.
	Tons.	Tons.	Tons.	Tons.
1804	....	52	....	....
1805	....	....	....	....
1806	....	41	62	....
1807	....	68	810	....
1808	....	312	1,391	....
1809	....	240	530	....
1810	....	400	603	....
1811	....	88	68	....
1812	....	622	120	....
1813	....	442	213	....
1814	....	321	429	....
1815	77	1,079	700	....
1816	35	600	673	....
1817	....	422	9	...
1818	317	247	349	....
1819	1,796	90	1,531	....
1820	1,408	124	2,200	....
1821	957	191	2,040	....
1822	521	412	1,923	....
1823	633	564	3,673	....
1824	436	358	4,471	....
1825	2,061	1,191	5,350	....
1826	505	1,115	4,271	....
1827	508	1,140	7,383	....
1828	320	3,555	8,510	199
1829	720	6,076	7,044	668
1830	415	1,788	9,115	934
1831	540	1,442	9,707	975
1832	646	3,184	11,399	641
1833	361	1,786	11,293	1,059
1834	377	3,336	17,280	2,077
1835	268	3,770	22,123	6,758
1836	535	1,698	21,013	9,046
1837	179	2,216	22,306	14,521
1838	964	3,410	22,161	19,868
1839	1,812	2,637	23,613	24,092
1840	752	1,525	20,166	35,354
1841	705	1,180	14,321	41,364
1842	1,910	857	15,253	44,392
1843	756	1,133	17,600	40,739
1844	430	700	20,063	45,491
1845	622	1,914	19,647	46,643
1846	549	1,035	17,553	39,348
1847	406	340	14,373	35,700

The great advance in the quantities of copper ores from Ireland, shows the advantage of a better system of mining in that country

than such as had been previously practised. Improvements are still required: there is no doubt but that the mineral resources of Ireland are of the highest order, they only wait further development.

The quantity of foreign copper ores imported has been steadily increasing. The largest quantities have been produced in the following localities.

Previously to 1848, the total quantities sold at Swansea, of which any returns can be obtained, were as follows:—

Cobre	172,634	tons of 21 cwt.	St. Jose in Cobre	8,246	tons of 21 cwt.
Chili	82,580	,,	Burra Burra	5,389	,,
Cuba	36,033	,,	Kapunda	2,354	,,
Santiago	57,230	,,	Bacuranco	1,112	,,
Copiapo	14,887	,,	Cobija	1,798	,,
Valparaiso	9,306	,,	Pennsylvania	1,454	,,
Norway	8,357	,,			

From that year to the end of 1854 the quantities of ore sold at Swansea have been as follows:—

From the Foreign Mines.

Name.	1848.	1849.	1850.	1851.	1852.	1853.	1854.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Cobre	17,564	19,409	5,905	14,724	11,106	9,141	12,804
Chili	3,398	213	662	421	....	407	311
Burra Burra	4,047	7,238	3,405	829	....	550	....
Cuba	7,486	2,697	4,548	2,955	3,799	3,829	3,110
Copiapo	765	710	875	406	892	796	1,070
Kepunda	661	213	949	868	889	893	732
Santiago	716	1,518	1,119	2,036	1,272	789	785
Recompensa	460	....	....	....	....	....	....
Giburra	....	151	....	....	....	....	....
Kanmantoo	321	....	....	....	169	....	....
Cabral	....	96	87	....	....	....	....
Montacute	93	....	....	....	....	....	....
New Zealand	....	....	....	96	....	....	....
Parniga	82	....	....	....	....	....	....
Havannah	....	209	....	161	....	302	....
Adelaide	33	....	135	48	....	....	....
Australian	40	....	....	65	113	....	102
Cantabra	43	....	....	....	....	....	....
Carridad	20	....	....	....	....	....	....
Kaw-aw	....	307	853	961	209	104	....
West Kaw-aw	....	....	....	423	64	....	....

It is necessary to name a few importations which are not included in the table. Amongst the sales we find—

In 1853.—	Montreal	893 tons.	In 1854.—	Peninsular	1,449 tons.
,,	Spanish ore	535 ,,	,,	African	378 ,,
,,	Malaga	547 ,,	,,	Spanish ore	687 ,,
,,	New Zealand	160 ,,	,,	Montreal	362 ,,
,,	Algiers	205 ,,	,,	Algiers	139 ,,
,,	Carthage	205 ,,	,,	South African	32 ,,

These returns exhibit in a curious manner the development of mining industries in several new countries, which promise to furnish us eventually with large supplies of copper ore. The Australian diggers will, without doubt, when the gold fever has declined, discover that they have, hidden in their rocks, treasures to be developed by healthful industry, in the shape of metalliferous ores, which will prove to them far more valuable than the auriferous deposits of their gold-fields.

Since 1847, the following Irish mines have sold copper ore at Swansea:—

Name.	1848.	1849.	1850.	1851.	1852.	1853.	1854.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bearhaven	5,872	5,812	6,137	6,969	5,692	5.868	5,030
Knockmahon	4,674	2,787	....	3,624	3,471	3,373	4,421
Holyford	302	....	....	....	89	499	555
Ballymurtagh	1,449	1,059	370	104	556	455	1,237
Lackamore	152	114	101	204	140	....	159
Cronebane	137	....	13	....	25	121	50
Gurtnadyne	....	....	154	....	....	....	....
Ballinoe	....	....	59	97	....	....	....
Tigrony	....	....	13	....	....	....	....
Connorree	....	....	....	....	22	40	....
Galway	....	....	....	....	....	54	....
Cosheen	....	....	....	....	....	....	45
Total quantities of ores sold in each year from the Irish mines by public ticketings at Swansea	12,586	9,772	6,847	10,998	9,995	10,410	11,505

There are a few private contract purchases in addition to those, and some ores, but not any considerable quantities, have been sold from English and Welsh mines. From Wales there was sold copper ore, in 1854, to the amount of 287 tons, the value of which was 2,011*l.* This was the produce of nine mines. The mines of Devonshire sold at Swansea 789 tons, mostly in small quantities. The Coniston mines, Greenbourn, and Laxey, sold 3,252 tons; of this 3,048 tons were from Coniston, the value of which was 26,611*l.*

The total quantities of copper smelted in this country since 1850, have been as follows, the quantities bought in Cornwall, at Swansea, and by private contract, being distinguished:—

	Cornwall.		Swansea.		Private Contract.		Total.	
	Tons	cwt.	Tons	cwt.	Tons	cwt.	Tons	cwt.
1850	12,253	10	7,108	8	4,506	6	23,868	4
1851	11,807	8	6,015	0	4,974	1	22,796	9
1852	11,776	17	4,901	18	3,836	7	20,515	2
1853	11,913	12	4,559	0	5,874	16	22,348	8
1854	11,964	12	4,726	19	5,426	3	22,117	14
1855	12,578	11	5,926	1	7,440	12	25,945	4

The production of copper in this country during last year, therefore, shows a large increase.

During those five years the exportation of British and foreign copper was as follows:—

	British.			Foreign.*			
	Tons	cwt	qrs.	Tons	cwt.	qrs.	lbs.
1850	21,307	12	2	1,001	4	3	7
1851	17,555	11	0	1,428	4	0	0
1852	16,936	1	0	1,357	9	0	0
1853	15,632	7	0	1,706	18	0	0
1854	13,678	5	0	1,822	0	0	0

The total imports of copper ore and regulus for the same period were—

	Ore.			Regulus.			
	Tons	cwt.	qrs.	Tons	cwt.	qrs.	lbs.
1850	40,388	5	3	5,473	12	1	26
1851	35,683	18	0	6,442	5	2	11
1852	37,817	12	2	5,226	0	1	21
1853†	45,285	19	1	5,107	4	0	15
1854	50,904	12	24	6,351	4	0	26

* This does not include foreign manufactured copper, which is entered in the returns by value.

† The duty on copper ore was repealed on the 4th of June, 1853.

[The remainder of Mr. Hunt's paper, treating of the yield of British mines in lead, iron, and other metals, and of the produce of our collieries, is unavoidably postponed till the next number of the Statistical Journal.]